



Romanian Master of Informatics

4th Edition, Bucharest, 20th -23rd October 2016

CPR (Cut-Paste-Reverse)

Consider the list of integers 1, 2, ..., N . On this list you can perform a series of cut-paste operations. A cut-paste operation $\langle x, y, z \rangle$ consists of cutting the sequence between the values x and y and inserting the sequence immediately after the value z (z can also be 0 to designate an insertion at the beginning of the list). A triplet $\langle x, y, z \rangle$ constitutes a correct cut-paste operation if

- x appears before y in the list, or $x = y$;
- z appears outside the sequence from x to y , or $z = 0$.

Task

Find a series of correct operations that reverses the list, so that after performing the operations the list becomes $N, N - 1, \dots, 2, 1$. The fewer operations you require, the higher your score will be.

Input data

The file **cpr.in** contains a single integer number N , representing the length of the list.

Output data

The file **cpr.out** must contain a number M on the first line, representing the number of cut-paste operations. Each of the following M lines must contain three numbers $x \ y \ z$ representing an operation.

Limits and constraints

- $1 \leq N \leq 5,000$
- Time limit: 0.1 seconds
- Memory limit: 64 MB

Scoring

Test cases will be scored **individually**. For every test, if your solution requires M operations, you will earn points as follows (slashes denote integer divisions):

- 100% of the points if $M \leq N / 2 + 1$;
- 80% of the points if $N / 2 + 1 < M \leq 2 * N / 3$;
- 60% of the points if $2 * N / 3 < M \leq 3 * N / 4$;
- 40% of the points if $3 * N / 4 < M \leq 4 * N / 5$;
- 20% of the points if $4 * N / 5 < M \leq 5 * N / 6$;
- 0 points if $M > 5 * N / 6$.



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Example

cpr.in	cpr.out	Explanation
6	4 2 6 0 4 5 0 3 6 4 6 5 0	<p>The initial list is 1 2 3 4 5 6</p> <p>After the first operation, the list becomes 2 3 4 5 6 1 (The operation 1 1 6 would have had the same result.)</p> <p>After the second operation, the list becomes 4 5 2 3 6 1</p> <p>After the third operation, the list becomes 4 3 6 5 2 1</p> <p>After the fourth operation, the list becomes 6 5 4 3 2 1</p> <p>This solution earns full points as $4 = 6 / 2 + 1$.</p>